

# GEOGRAPHY

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## **GEO 6419 Seminar: South America 3 Credits**

**Grading Scheme:** Letter Grade

Cultural, economic, political, and resource characteristics and development of representative areas.

## **GEO 6466 Seminar on Geography of Amazonia 3 Credits**

**Grading Scheme:** Letter Grade

Exploration of biophysical basis of natural resource management, cultural diversity, and economic development in Amazonia.

## **GEO 5305 Environmental Biogeography 3 Credits**

**Grading Scheme:** Letter Grade

Description and explanation of spatial patterns of biodiversity, and underlying biophysical factors of human-environment interactions. Past and present distributions of organisms and how patterns of environmental variation influence the organisms. Biogeography is useful for designing nature reserves, forecasting how climate change may affect organisms, and explaining human adaptations to environmental variability. This class takes a mostly ecological approach to understanding biogeography.

**Prerequisite:** Graduate standing.

## **GEO 5349 Weather, Climate, and Society 3 Credits**

**Grading Scheme:** Letter Grade

Investigates social vulnerability to hazards, disasters, and climate change through perspectives and experiences of vulnerable population segments who often bear brunt of losses, yet exhibit remarkable flexibility and creativity in coping and adapting to environmental risks. Introduces students to census data and spatial analysis to understand geographies of social vulnerability.

## **GEO 5920 Geography Colloquium 1 Credit, Max 6 Credits**

**Grading Scheme:** S/U

Presentation and discussion of contemporary geographic research.

## **GEO 6118 Contemporary Geographic Thought and Research 3 Credits**

**Grading Scheme:** Letter Grade

Summary of major currents of intellectual thought and research orientations in contemporary geography.

**Prerequisite:** admission to graduate program in geography.

## **GEO 6119 Proposal Writing in Geography 3 Credits**

**Grading Scheme:** Letter Grade

Research design, proposal writing and proposal evaluation for geographic studies.

**Prerequisite:** Graduate standing in Geography or consent of instructor

## **GEO 6160 Introduction to Quantitative Methods for Geographers 3 Credits**

**Grading Scheme:** Letter Grade

Working knowledge of statistical and quantitative techniques used by geographers. Focuses on spatial analysis.

**Prerequisite:** statistics.

## **GEO 6161 Intermediate Quantitative Methods for Geographers 3 Credits**

**Grading Scheme:** Letter Grade

Statistical techniques used in the spatial and social sciences. Regression analysis for cross-sectional, qualitative, time-series, and geocoded data.

**Prerequisite:** GEO 6160.

## **GEO 6166 Advanced Quantitative Methods for Spatial Analysis 3 Credits**

**Grading Scheme:** Letter Grade

Critical examination and analysis of spatial data and point patterns, trend-surface modeling and interpolation, count data modeling, cluster and hot-spot detection, process change statistics in space and time, and spatial regression models.

**Prerequisite:** GEO 6160 and GEO 6161 or equivalent or permission of instructor

## **GEO 6168 Spatial Econometrics and Modeling 3 Credits**

**Grading Scheme:** Letter Grade

Introduces regression models capable of dealing with spatial auto-correlation. Students develop statistical models and estimate with computer software.

**Prerequisite:** GEO 6161 or equivalent.

## **GEO 6255 Climatology 3 Credits**

**Grading Scheme:** Letter Grade

Climatology in a global context. Emphasizes energy budgets, weather systems in the tropics and extratropics, and atmospheric teleconnections such as El Nino.

**Prerequisite:** Introductory weather and climate course taken as an undergrad.

## **GEO 6282 Fluvial Morphology 3 Credits**

**Grading Scheme:** Letter Grade

Study of fluvial processes, landforms and deposits and their changes due to environmental factors and human activities.

**Prerequisite:** Graduate standing, a basic physical geography or geology course and an introductory statistics course. Other interested individuals should consult instructor.

## **GEO 6335 Managing for a Changing Climate 3 Credits**

**Grading Scheme:** Letter Grade

An interdisciplinary survey of climate variability and change. Topics include the physical science basis for climate change, followed by sectoral analysis of climate impacts, adaptation, and mitigation options. Active learning, discussions, and roleplaying facilitate understanding of critical issues facing the human and natural world.

## **GEO 6346 Climate Change and Health 3 Credits**

**Grading Scheme:** Letter Grade

Presents the science of climate change and impacts on health. Discussion builds on core concepts of climate change science to examine a variety of topics from acute impacts such as heat waves and other weather extremes to chronic conditions like degraded air quality. Mitigation and adaptation strategies are also discussed.

## **GEO 6348 Floods Seminar 3 Credits**

**Grading Scheme:** Letter Grade

Analysis of the world's most extreme floods from the Pleistocene through present due to various causes. Emphasizes physical and human aspects of flood warning, preparedness, response and recovery throughout the world.

## **GEO 6375 Land Change Science Seminar 3 Credits**

**Grading Scheme:** Letter Grade

Interdisciplinary study of land use and land cover change dynamics and their relationship with global environmental change.

**GEO 6408 Parks and People 3 Credits****Grading Scheme:** Letter Grade

Introduces students to the multiple dimensions of protected areas and people; discusses the history of parks on several continents, and their more well-known biodiversity dimensions; emphasizes the economic attributes of parks and their governance, and moves beyond public conservation to consider private and community approaches.

**GEO 6451 Medical Geography 3 Credits****Grading Scheme:** Letter Grade

Studying human-environment interactions and the influence of these interactions on public health. This course provides a broad-based, comprehensive survey of geographic approaches in medical studies.

**Prerequisite:** None.**GEO 6455 Advanced Study Design in Medical Geography 3 Credits****Grading Scheme:** Letter Grade

Examines problem solving with a focus on the assumptions that underlie methods and strategies to analyze health outcomes. Integrates health with environmental conditions in a spatially explicit manner. Evaluates alternative methods of detection, analyses, data and study design. Examines the implicit and explicit limitations.

**Prerequisite:** (GIS 3420C or 6425C) and (GEO 3452 or 6421) or consent of instructor**GEO 6706 Transportation and Urban Accessibility 3 Credits****Grading Scheme:** Letter Grade

Investigates the relationship between transportation and urban accessibility from a geographic perspective, through the examination of the impacts of transportation systems and accessibility on human health, social equity, and the environment, as well as the methods and tools for modeling and analyzing transportation systems and accessibility.

**GEO 6905 Individual Work 1-5 Credits, Max 12 Credits****Grading Scheme:** Letter Grade

Individual Work

**GEO 6921 How to Survive and Thrive in Academia 1 Credit****Grading Scheme:** Letter Grade

Strategies and approaches, from preparation in graduate school, to success on the academic job market, to getting tenure.

**GEO 6931 Seminar in Cultural and Political Ecology 3 Credits****Grading Scheme:** Letter Grade

Human-environment relationships from the perspective of cultural and political ecology.

**GEO 6938 Selected Topics in Geography 1-5 Credits, Max 15 Credits****Grading Scheme:** Letter Grade

Selected Topics in Geography

**Prerequisite:** graduate standing in geography or a related field.**GEO 6971 Research for Master's Thesis 1-15 Credits****Grading Scheme:** S/U

Research for Master's Thesis

**GEO 7979 Advanced Research 1-12 Credits****Grading Scheme:** S/U

Research for doctoral students before admission to candidacy. Designed for students with a master's degree in the field of study or for students who have been accepted for a doctoral program. Not appropriate for students who have been admitted to candidacy.

**GEO 7980 Research for Doctoral Dissertation 1-15 Credits****Grading Scheme:** S/U

Research for Doctoral Dissertation

**GEY 6341 Shelter and Care Options for U.S. Elderly 3 Credits****Grading Scheme:** Letter Grade

Examining how the housing and long-term care arrangements of older adults in the United States influence their ability to age successfully, that is, to be fully engaged in life and to effectively cope with their chronic health conditions and disabilities.

**GIS 5008C Maps and Graphs 4 Credits****Grading Scheme:** Letter Grade

General introduction to principles and techniques of thematic cartography and cartographic applications.

**Prerequisite:** graduate standing.**GIS 5028C Advanced Aerial Photo Interpretation 3 Credits****Grading Scheme:** Letter Grade

Uses of aerial photographs in geographical research.

**Prerequisite:** GEO 2200 or consent of instructor.**GIS 5038C Remote Sensing 4 Credits****Grading Scheme:** Letter Grade

Uses of remote sensing imagery in geographical research.

**Prerequisite:** GEO 4120C.**GIS 5107C Geographic Information Systems in Research 4 Credits****Grading Scheme:** Letter Grade

Geographic technology for creating, modifying, displaying, and analyzing spatial information. Geographic analysis and reasoning, computer software and hardware technology, and research applications of GIS. Geographic databases.

**GIS 5505 Population GIS 3 Credits****Grading Scheme:** Letter Grade

Instruction on geographic and cartographic techniques for geospatial analysis of population, demographic, and socioeconomic data using ArcGIS Pro. Students identify and utilize current and historical secondary population data sources for GIS analysis of population changes, and for mapping of segregation, inequality, and well-being indicators.

**Corequisite:** GIS 5107C with minimum grade of C or equivalent.**GIS 6104 Spatial Networks 3 Credits****Grading Scheme:** Letter Grade

Many phenomena of interest in physical, social, and cyber environments can be thought of as networks within geographic context. This course teaches methods for analyzing these spacial networks, and introduces their applications in geography, urban studies, transportation, hydrology, epidemiology, social science, etc.

**Prerequisite:** Entry level knowledge of statistics (GEO6160, or equivalent) or the consent of the instructor. Prior experiences with ArcGIS is preferred, but not required.**GIS 6106C GeoAI - Geographic Artificial Intelligence 3 Credits****Grading Scheme:** Letter Grade

Geography and AI integration, or GeoAI (a subfield of spatial data science), provides novel approaches for addressing a variety of geospatial problems in the natural environment and our human society. Will involve lectures, discussions hands-on computing labs using real-world geospatial data to address such AI topics as: image classification, object detection, scene segmentation, simulation and interpolation, retrieval and question answering, on-the-fly data integration, and geo-enrichment.

**Prerequisite:** Any GIS4XXX, GIS5XXX, GIS6XXX or permission of instructor.

**GIS 6117 Applied Geostats 3 Credits****Grading Scheme:** Letter Grade

Introduces fundamentals and GIS practices of geostatistical analysis (or the kriging), which addresses optimal spatial interpolation. Geostatistics are currently applied in diverse disciplines such as geography, geology, engineering, hydrology, urban studies, and epidemiology.

**Prerequisite:** Entry level knowledge of both statistics (STA2023, GEO3162C/6160, or equivalent) and GIS (GIS3043/5107C or equivalent), or the consent of the instructor.

**GIS 6125C Geocomputation using R Programming 3 Credits****Grading Scheme:** Letter Grade

Introduction to geodata analysis using programming. Broad introduction to the programming language as well as applied spatial data analysis. Primary outcome is to facilitate students' use of programming to analyze data of their own choosing on a final project. Code sharing and re-use is highly emphasized, as is collaboration.

**GIS 6325 GIS Analysis of Hazard Vulnerability 3 Credits****Grading Scheme:** Letter Grade

Instruction on geographic and cartographic techniques for geospatial analysis of risk, vulnerability, and resilience using ArcGIS. Students learn to utilize physical and human geographic datasets for multiple hazard contexts including hydrometeorological, climatological, and geophysical hazards.

**Prerequisite:** GIS 3043 with minimum grade of C or URP 4273 with minimum grade of C.

**GIS 6425C GIS Models for Public Health 3 Credits****Grading Scheme:** Letter Grade

Focusing on the design of GIS-based models to address health and health care issues. Major topics include: a conceptual framework, landscape epidemiology models, disease diffusion models, health accessibility, human health behavior, and location-allocation of health services. Lab section helps students gain hands-on experience applying these models with GIS tools.

**Prerequisite:** (GEO4167C/GEO 6160 , or equivalent) and GIS (GIS3043/ GIS 5107C , or equivalent), or the consent of the instructor

**GIS 6456C Applications in GIS for Zoonoses and Disease Ecology 3 Credits****Grading Scheme:** Letter Grade

An advanced-level course for medical geography, and sister disciplines (epidemiology, public health, ecology). It can serve as an undergraduate level major or minor requirement. Focus is on GIS applications in spatial analysis and ecology to address common research issues related to zoonotic diseases (those affecting animals and humans).

**Prerequisite:** GIS 3043 and Geography 6161C or equivalents or consent of instructor. Students from public health backgrounds may inquire about course equivalents.

**MET 5504 Weather and Forecasting 3 Credits****Grading Scheme:** Letter Grade

Skill development in predicting and discussing daily weather patterns using meteorological instruments to collect data and analyze weather events.

**Prerequisite:** familiarity with basic meteorology.

**MET 6530 Hurricanes 3 Credits****Grading Scheme:** Letter Grade

Meteorological and climatological concepts related to hurricanes. Forecasting current activity; researching past storms; and analyzing storm structure, damage, and future trends.

**Prerequisite:** familiarity with basic meteorology.

**MET 6565 Seminar in Atmospheric Teleconnections 3 Credits****Grading Scheme:** Letter Grade

Atmospheric teleconnections are recurring large-scale patterns of pressure and circulation anomalies. They can influence temperature, rainfall, storm tracks, and jet stream location/ intensity. We will examine how these patterns were discovered, how the index that characterizes the phase of each teleconnection is calculated, and the weather associated with different phases.

**MET 6752 Spatial Analysis of Atmospheric Data using GIS 3 Credits****Grading Scheme:** Letter Grade

How atmospheric data are collected and analyzed both for meteorologic and climatologic-scale research. Learn where to obtain various types of data and how to analyze data to answer specific research questions.